

## **VII. Changing Your Frame of Reference**

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## **Changing Your Frame of Reference**

While the clinical care of patients is familiar to all of you, the circumstances which will define the way that you give care in the developing world are likely to surprise you. It is the goal of this module to attempt to prepare you for the deviations from your normal practice that you will of necessity make when working in a disaster setting. We will discuss three issues:

Standards of Care  
Empiricism  
Medical Supplies

Our intent is not to give you definitive rules for how you should “practice medicine”, but to make you aware of the dilemma’s created by harsh realities. In class we will discuss case scenario’s from the annals of real experience. We hope that through thoughtful consideration and discussion of the issues raised, you will be better prepared to make sound decisions that serve the patient and family and are appropriate for the circumstances when you are deployed.

### **Standards of Care**

When we talk about differences in standards of care in the developing world, we are not talking about differences in moral or ethical standards. People in the developing world care about and assign importance to many of the same things that you do. They value their families, particularly their children, they worry about the effects of violence on their families and communities, and they want the availability of quality health care. So it is not generally values, morals or a desire for quality that drives the differences in the standards of care- but rather resources. The average annual expenditure on health care in a developing country is \$8 per person per year. Therefore resources dictate who provides medical care, sometimes who is treated, how they are cared for and what medications/supplies are available for treatment.

### **Who Provides Medical Care**

In the developing world nurses and informally trained community health workers provide most of the direct medical care. They alone are likely to run rural health clinics and even small district hospitals where they diagnose and treat patients even admitting them overnight- without the direct supervision of a physician. In a disaster setting, another resource poor setting where there will never be enough physicians to achieve the physician to patient ratios that you are accustomed to, you should consider this model and make use of nursing and community assets as health provider multipliers. Community health workers, who may have little formal education, are trained for specific vital tasks- for example, the administration of Oral Rehydration (ORT) and the training of parents in continuing ORT at home. It can be difficult for a physician to realize that the best investment of his/her time, even amid very high patient demands, may be in training others to perform certain repetitive tasks. These tasks may include the diagnosis and management, following algorithms, of common conditions. These health provider

multipliers can provide vital medical care and allow the physician to concentrate on problems commensurate with a physicians level of training.

### Who Is Treated

Among the most difficult dilemmas for those of us trained amid plentiful resources is making determinations of who should get care. In a resource poor environment you may have to decide which cases are helpless and assigned to expectant care. This includes not only the massive trauma victim, but also for example an extreme LBW infant that we might resuscitate in our delivery room. In many parts of the world that child will die quietly at home after birth because there are simply not the resources to provide life sustaining care. Resuscitation of someone who experienced cardiorespiratory arrest only makes sense if you have a facility that can support post resuscitation intensive care- this is also for the most part a luxury of the developed world. Interventions that we are trained to think of reflexively need to be considered in the context of the environment. If I initiate this intervention, can it be sustained?

### How Treatment Is Carried Out

The availability of resources also determines how treatment is carried out. In the developing world IV therapy is often considered an extraordinary intervention. It is expensive, both in dollars for sterile supplies and manpower to administer and monitor medications or fluids by this route. There is a much greater reliance on oral medications, including oral rehydration, and IM injections. The oral medications for children are unlikely to be suspensions, but rather the same tablets or capsules used for adults. Convenience and ease of administration are forsaken for cost and durability. Tablets are less expensive (therefore more people can be treated for the same cost) and have longer shelf lives than suspensions. Local health workers and parents will be accustomed to administering these medications to young children by making them into pastes and various other techniques.

### What Is Used To Treat

In addition to differences in formulations, the pharmaceutical choices that you will encounter in the developing world will differ substantially from those that are familiar to you. You will not find “comfort meds” like cold and cough remedies, even antipyretics will be used more conservatively- because, as much as we love Tylenol it never cured anyone of anything. In the US, children die every year from accidental overdose of these “comfort meds”. Dispensing them into cultures without awareness of the toxicity’s (No “Mr Yuck campaign”), and without the ability to secure these products in locked cupboards, is criminal. The antibiotics you are likely to encounter are of the low cost, low glamour variety that we tend to shun, like Penicillin, Septra and Chloramphenicol. These choices make sense when evaluated in the context of the desired outcome for the environment.

For example consider the treatment of pneumococcal pneumonia. Imagine a hypothetical situation in which there is Penicillin resistance in 20% of the pneumococcal isolates. In the US we would likely conclude that the anticipated failure rate of Penicillin of 20% is too high. So empiric treatment for suspected pneumococcal pneumonia is a

third generation Cephalosporin. Unsuccessful treatment of the minority is not perceived as tolerable in our environment.

Drug	Penicillin	Third Gen Cephalosporin
Pneumococcal resistance	20%	5%
Cost per person per treatment	\$1	\$100

In a resource poor country the analysis of the same data might be quite different. Penicillin is a reasonable treatment because we can afford to treat every patient and can cure at least 80% of pneumococcal pneumonias.

As you begin to appreciate that medical standards of care differ in other parts of the world, and that these differences are likely to be exaggerated in a disaster setting you may be asking yourself *“is it ethical for me to change my standards of practice because I suddenly find myself working in a resource poor environment ? To not aggressively resuscitate a very low birth weight infant? To use medications that I believe are inferior?”*

## CASE DISCUSSION #1: THE DELIVERY ROOM DILEMMA

### Dual Standards

In the military, we bring our “standard of care” for treating ourselves wherever we go, or we provide for rapid air evacuation to support hospitals likely located within the theater of operation.. You will always have access to the “best” medical care for yourself and your soldiers. However, even when the military participates as part of its mission statement in the care of civilian casualties, there is some limitation on the civilians access to the full medical resources. Where the access line is drawn depends on the operation and sometimes on local commanders. In Operation Provide Comfort, Army physicians and medics were used as primary care providers for civilians in refugee camps, however patients requiring higher levels of care (inpatient) had to be referred to the local civilian hospitals which were in total disarray. An Air Force Air Transportable Hospital was operational in the theater, but was exclusively reserved for the care of military casualties-since there were few, it went largely unused. Two co-existing “standards of care” are characteristic of military humanitarian operations.

## CASE DISCUSSION #2: DIFFICULT DECISIONS

### Resource Rules

Dual standards of care pose significant ethical dilemmas- or at least appears antithetical with altruism and “humanitarianism”. Remember that military humanitarian operations are strategic operations that also serve a humanitarian need. There are good reasons to limit elevating the standard of care of the affected population in some situations. Consider that if access to the “new standard” cannot be assured to all of the affected population then the perception of selection of the population for special treatment can occur. Imagine this example: Sector A has disproportionate admission rates of civilian casualties to the American Hospital as compared to sector B and C. The real reason for the selection might be that functioning telephone lines to sector A allowed better communication with the physicians working there thus resulting in greater referral success for the limited number of beds. But if sector A is made up of an ethnic sub-group, the perception of selection can have unanticipated implication. The political and real sequelae of such a perception can be devastating to the strategic objectives of an operation. Consequently a general rule regarding setting standards for access to resources is to be sure that universal access can be provided for all of the affected population, or not at all. If there are not enough beds in the military facility to treat all patients of equal severity of illness, then perhaps those beds should not be used at all.

Another potential pitfall is providing a resource standard to a refugee population, that exceeds what is available to the local community in the host nation. Refugees are generally not welcomed by the host population. The mass movement of thousands of people into an area causes destruction of the physical environment, exhaustion of fuel sources and economic havoc. The perception that a refugee population has a higher living standard because of foreign aid, or access to better medical care can incite local hostilities. So the circle which must be filled by relief workers enlarges. Not only must the resource standard be available universally to the affected population, but it must be available to the surrounding community. Quickly, the resources of even a large organization like the military can be overwhelmed by such a proposition. Therefore, limited access to full military resources is a necessity in large humanitarian operations.

As unfair as the dual standard appears, realize that the majority of deaths in humanitarian emergencies do not occur because of a lack of sophisticated, technical medical care, but rather inadequate basic medical care and public health. Recall that the primary sources of mortality are preventable or readily treatable diseases like dehydration, malnutrition and infections. It is far more important to provide universal basic health care than limited sophisticated treatment.

### Setting Your Standard

The establishment of resource limits, like access to inpatient or surgical care, occurs at a command level. But the same principles should be applied in the use of local resources in the delivery of primary care. As a provider, you may have access to medical supplies from both a military field unit as well as typical disaster relief supplies. For example, should you treat the suspected case of pneumonia in a 12 yo with Penicillin (of

which you have 10,000 doses in your disaster relief supplies) or with Ceftriaxone (50 doses in your military medical supplies). The local population will know the difference between Penicillin and Ceftriaxone (they may not be familiar with ceftriaxone). When you choose a medication that is familiar to you, but unfamiliar to the population and perhaps unavailable to other health care providers you should at least consider the consequences. Am I creating a standard that I cannot sustain equitably with the available supplies? Am I creating a standard that differs substantially from that which is being provided by other health workers in this operation? The other providers may include NGO's working in medical care nearby. Obviously withholding a life saving drug in a critically ill patient is not ethically justifiable. But more often than not, we choose medications because they are familiar rather than necessary in that setting. Pharmaceutical supplies for short term nation building/humanitarian missions into developing countries are often derived from lists of the most frequently used medications in the pediatric clinic at the home base. In using these drugs we introduce unfamiliar medications with unfamiliar side effect profiles. Imagine the small community in Honduras attempting to explain the diarrhea outbreak caused by the Americans who had liberally dispensed Augmentin for the minor infections they encountered.

In the final analysis, the "standard of care" is a resource issue. You need to be aware of your resource limitations and the possible implications of using resources in the environment that you are working. There is no one "right" standard, but you must adopt a standard of practice that is appropriate for your environment and situation.

### **Empiricism**

The second issue that is very striking to American trained physicians when working in an austere environment is the necessary but uncomfortable reliance on empiricism.

Empiricism is the practice of relying on observation and experience rather than data. We are trained to avoid empiricism. However, the real world environment will dictate your access to diagnostic tests (the data that you would like to guide your clinical decisions); and the magnitude of your patient load will dictate the time you will be allowed to ponder diagnostic possibilities. Military physicians in humanitarian assistance operations have frequently reported seeing or supervising the care of 60-100 patients per day. The reality is that both diagnostic resources and time will be quite limited.

### **CASE DISCUSSION #3: AN IRRITABLE INFANT WITH FEVER**

It is desirable to pursue educated empiricism whenever possible. This is particularly important when dealing with a disease of epidemic potential. As will be discussed in more detail in the Infections module, the recognition of a possible case of cholera necessitates calling in all available public health resources. The clinical diagnosis of cholera must be microbiologically confirmed because the public health ramifications are enormous. The limited public health and diagnostic resources available

in a disaster setting will be focused on issues of greatest public health concern, thus leaving most clinical disease to be diagnosed and managed empirically.

### **Medical Supplies- An Introduction to the WHO Emergency Health Kit**

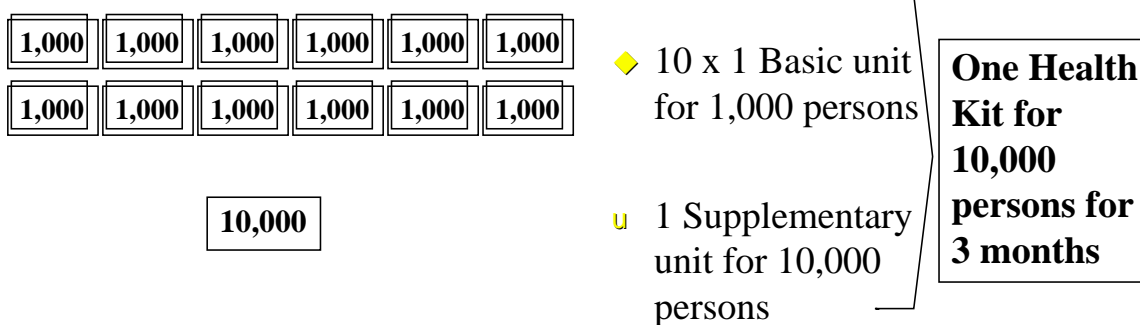
As we have already discussed, certain drugs and supplies may be more appropriate or simply more available in the disaster setting in the developing world. The World Health Organization in collaboration with several other international health organizations (UNHCR, The London School of Tropical Medicine, UNICEF, Medecins sans Frontieres, The League of Red Cross and Red Crescent Societies, the World Council of Churches, and the ICRC) developed a pre-packaged “kit” with suitable supplies for virtually any crisis in the developing world. This creation was driven by past failures in being able to obtain timely and appropriate supplies for disaster settings. Prior to the development of this kit much of the supplies donated by governments and agencies during a disaster were unsuitable, unsorted, unlabeled or expired and delivery of these supplies was often delayed. The WHO Emergency Health Kit is a reliable, standardized, inexpensive, appropriate and available source of the essential drugs and health equipment urgently needed in a disaster situation. The kits are stockpiled around the world and are packaged such that they can be air dropped into many environments. The entire contents of the kit are included in the appendix to this section. Because the inclusion criteria for meds in this kit is based on cost effectiveness and storage characteristics in difficult climates, many developing nations have used it as the model on which to stock all of their national health facilities. These are generally the supplies used by international health agencies and should serve as a model for military units deploying to care for civilians in the developing world. One complete kit is designed to provide adequate medical supplies for 10,000 persons for 3 months under most circumstances.

The total kit is divided into basic units and a supplementary unit. The basic unit contains drugs and supplies for the use of primary health care providers with limited training-like a nurse or community health worker. There are 10 basic units in a kit. None of the drugs are injectables, but there are oral and topical medications and oral rehydration salts. Simple treatment guidelines are included to help in training personnel to function somewhat independently with these supplies.

The supplementary unit contains drugs and medical supplies for the use of a physician. The injectable drugs and some other meds are only found in the supplementary unit. It does not contain any of the same supplies found in the basic unit. Therefore a physician would want to use supplies from both kits together, while it would be appropriate to supply a community health worker with more limited training only a basic unit.

There are additional supplementary kits not depicted here used for special circumstances. For example an immunization kit which contains adequate supplies for maintaining a cold chain and injection equipment for 5,000 immunizations.

## THE WHO EMERGENCY HEALTH KIT



The appendix to this section reviews the characteristics of the antibiotics that are found in the kit. Antibiotics are the most commonly dispensed medications and these will be reviewed in class. You will be expected to be familiar with using these medications in the skill stations.



antipyretics/anti-inflammatory

acetylsalicylic acid	300 mg	tablets	3000	x 10
paracetamol	100 mg	tablets	1000	x 10

nutritional supplements

vitamin A	200,000 IU	caps	4000	
ferrous sulfate + folic acid	200/.25 mg	tablet	2000	x 10
folic acid	1mg	tablet	5000	
ascorbic acid	250 mg	tablet	4000	

antiseptics

benzyl benzoate	25%	lotion	1 liter	x 10
chlorhexidine	5%		1 liter	x 10

dermatologics

polyvidone iodine	10%	solution	500 ml	
zinc oxide	10%	ointment	2kg	
benzoic acid + salicylic acid	6%/3%	ointment	1kg	

antibiotic

ampicillin	250 mg	tablet	2000	
ampicillin	500 mg	inject vial	200	
benzathine benzylpenicillin	2.4 MIU	inject vial	50	
chloramphenicol	250 mg	caps	2000	
chloramphenicol	1 gm	inject vial	500	
metronidazole	250 mg	tabs	2000	
sulfamethoxazole	400 mg			
+ trimethoprim	+ 80 mg	tablet	2000	x 10
phenoxymethylpenicillin	250 mg	tablet	4000	
procaine benzylpenicillin	3-4MU	inject vial	1000	
tetracycline	250 mg	cap/tab	2000	
tetracycline	1%	ophthal ointment	50	x 10
gentian violet	25 gm	powder		x 10
mebendazole	100 mg	tablet	500	x 10
nystatin	100,000 IU	tablet	2000	

antimalarials

chloroquine	150 mg base	tablet	2000	x 10
quinine	300 mg/ml	2ml inject vial	100	
quinine sulfate	300 mg	tablet	3000	
sulfadoxine + pyrimethamine	500 mg +25 mg	tablet	300	

analgesics

pentazocine	30 mg/ml	1 ml inj vial	50
probenicid	500 mg	tablet	500

anesthetics

ketamine	50 mg/ml	10 ml inject vial	25
lidocaine	1%	20 ml inject vial	50

anti-allergics

dexamethasone	4 mg/ml	1 ml inject vial	50
prednisolone	5 mg	tablet	100
epinephrine	1 mg/ml	1 ml inject vial	50

anti-epileptics

diazepam	5 mg/ml	2 ml inject vial	200
phenobarbitol	50 mg	tablets	1000

cardiovascular

methyldopa	250 mg	tablet	500
hydralazine	20 mg/ml	1 ml inject vial	20

diuretics

furosemide	10 mg/ml	2 ml inject vial	20
furosemide	40 mg	tablet	200

gastrointestinal

aluminum hydroxide	500 mg	tablets	1000	x 10
promethazine	25 mg	tablet	500	
promethazine	1 mg/ml	2 ml inject vial	50	
atropine	1 mg/ml	1 ml inject vial	50	

respiratory

aminophylline	100 mg	tablet	1000
aminophylline	25 mg/ml	10 ml inject vial	50

psychotherapeutics

chlorpromazine	25 mg/ml	2 ml inject vial	20
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solutions correcting water/electrolyte/acid-base

ORS	sachet for 1 liter	200	x 10
ringers lactate	500 ml bag	200	
glucose (D5W)	5%	500 ml bag	100
glucose	50%	50 ml bag	20
water for injection	10 ml vial	2000	

<u>oxytoxics</u>			
ergotmetrine maleate	.2 mg/ml	1 ml inject vial	200

## Changing Your Frame of Reference

### Case Discussions

## CASE DISCUSSION #1: THE DELIVERY ROOM DILEMMA

*I happened to find myself while participating in a military exercise in Africa, visiting a rural regional hospital where the local GP was about to deliver a baby by c-section. He was performing a cesarean because the women had been in labor for 36 hours, was febrile and fatigued and there had been no further progression for the last several hours. He had ruptured her membranes a few hours ago and reported thick meconium. They had no fetal monitors but together we listened to the fetal heart sounds with a fetascope and counted a HR of 70 that was persistent. He was the only physician there and had one nurse and he was waiting for the anesthesiologist to arrive who was driving from some distance away. I volunteered to assist him by taking care of the infant resuscitation after delivery. I began preparing as I had been trained and found that I would be setting up on a counter on the side of the room. I was given a heating lamp and an oxygen tank was wheeled in at my request. Unfortunately there was only a self inflating ambu bag so I would not be able to ventilate with oxygen. This struck me as strange and somewhat irritating that it was all they had- but I kept up with my preparations. I was to share the suction apparatus with the anesthesiologist. The equipment was at an inconvenient distance away, but additional tubing was rigged together so it would reach me. Next I asked for ET tubes. The nurse looked at me quite quizzically, and she and the local doctor exchanged some words in their language and I was brought a single ET tube that was a 4.0 and was in an open package. I was informed that this was the only small ET tube that they had. There was one small blade for the laryngoscope. And as I started to mentally run through my resuscitation plan, having good reason to expect a severely depressed, possibly septic or meconium aspiration infant, I suddenly had a reality flash. If this infant required intubation and ventilation what would I do with it. This regional hospital had only one doctor and one nurse. Intensive care was giving intravenous therapy. There was no ventilator, in fact I could not even hand ventilate with oxygen through the ambu bag.*

*The prior day I had visited the national medical center in the capitol city 100 miles away. They had a NICU; the only one in the country. But I recalled that in their 150 bed NICU they had only 2 ventilators, and one of them had been broken and waiting for a part from Europe. The other ventilator had no occupant. I'm not sure what criteria they had for putting an infant on a ventilator, but one had the impression that it was not a frequent event. I also had no means to get the child there even if I believed that they would use their resources for this situation. As they began the c-section, my heart was in my throat - not because of what I might have to do but because I had to decide what I would not do. I had to decide how far I would go with a resuscitation.*

What are the choices?

What would you do?

Is it ethical to not use the technical skills that you have?

*I decided to vigorously suck out meconium from the airway using the ET tube then withdraw the ET tube and provide only a few bag breaths if necessary followed by blow by oxygen. That would have to be enough. There was no place to go with anything more aggressive. As I looked around the room I realized that my dilemma. was not shared or even perceived by the others in the room.*

Why is the dilemma only the American doctors?

## CASE DISCUSSION #2: DIFFICULT DECISIONS

*On my first day working in a refugee camp in Kurdistan, a 1 yo child was accidentally blown out of his mothers arms and into the river by a Chinook helicopter landing to bring supplies. The child was scooped out of the river several hundred yards downstream and brought to me. He was severely hypothermic as the river was ice cold and I removed his clothing and wrapped him in dry blankets. He was unconscious and responsive only to painful stimuli . He had severe respiratory distress with rales and rhonchi throughout his lung fields and persistent cyanosis. He had clearly aspirated river water and had multiple depressed and crepitant skull fractures likely from his ride over the river rocks, but no extremities appeared broken or at least were not deformed. From his general appearance it was also clear that he was severely marasmic.*

*When the helicopter crew became aware of what had happened they offered to change their flight plan and bring the child to one of the hospitals we were aware of in the region. We made radio contact with the Air Force Air Transportable Hospital which was about one hundred miles away - but they informed us that they were not accepting civilian casualties. There was a civilian hospital that was being resurrected from the rubble after the war in Zakho, but we had no way to contact them.. The mother and infant were quickly bundled up onto the Chinook for a flight to Zakho. We had no interpreter on the scene so I don't believe we asked her if she wanted to go. The deafening sound of the Chinook waiting in idle made communication difficult anyway. I had a sense of urgency in getting the child to a higher level of care as there was nothing I could offer the child in the primitive setting of the camp.*

What would you have done?

Is sending the child to the civilian hospital a reasonable use of resources ?

*It seemed like a reasonable response at the time, particularly amid the chaos and hysteria that followed the accident. Unfortunately, the civilian hospital, which we had heard about but not seen, was as yet minimally functional, poorly staffed and supplied. It was overwhelmed with literally hundreds of civilians mobbing its gates everyday- most of them turned away. When our child arrived, he was still alive according to the pilots but immediately triaged to expectant care. He never saw a physician.*

*As if that were not enough, our well intended decision to seek a higher level of care tied up that Chinook for several hours. The Chinooks mission was to deliver food and medical supplies to camps. However, the greatest tragedy was that the mother was of necessity left at the hospital with her son. After the Chinook left the camp we discovered that she had three other children in the camp. Her husband had not been seen for weeks and was believed to be fighting with the rebels. The mother was now impossibly separated by a hundred miles from her other children who remained unattended in the refugee camp. I realized that a woman alone in a muslim country would never be able to travel back to that mountain camp. I have often wondered if that family was ever re-united.*

Does the outcome change your view about the appropriateness of the decision to send the child to a hospital ?

Do you agree that if the likely outcome of the child's death had been foreseen and accepted in the camp, the remainder of the tragedy could have been avoided ?

How do you feel about the limited access to the resources of the Air Transport Hospital ?



### CASE DISCUSSION #3: AN IRRITABLE INFANT WITH FEVER

*You are in the clinic at WRAMC and evaluating an irritable, inconsolable 8 mo with a temp of 105 and a non-focal exam.*

What would be in your differential diagnosis?  
What diagnostic tests would you like to perform?

*Instead imagine that you are evaluating the same patient but are in a medical treatment tent on the side of a mountain as part of a medical response team in a humanitarian disaster. You do not have the ability to obtain a CBC, urine, blood or CSF culture. And, you do not have a reasonable referral location.*

What would you do?

*You also recall that you are in an area with endemic malaria.*

How would this change your empiric management?

In the most austere environments empiricism is a necessary evil.  
If you do not have a hospital or referral site you will likely be treating this infant for the possibility of sepsis/meningitis and malaria and sending them back to their tent for outpatient re-evaluation the next day.